



# PLANT PROTECTION BULLETIN

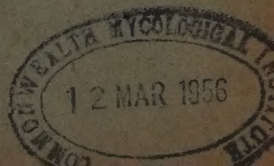
A Publication of the  
WORLD REPORTING SERVICE ON PLANT DISEASES AND PESTS

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DECEMBER 1955

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## FAO PLANT PROTECTION BULLETIN

is issued as a medium for the dissemination of information received by the World Reporting Service on Plant Diseases and Pests, established in accordance with the provisions of the International Plant Protection Convention, 1951. It publishes reports on the occurrence, outbreak and control of pests and diseases of plants and plant products of economic significance and related topics, with special reference to current information. No responsibility is assumed by FAO for opinions and viewpoints expressed in the Bulletin.

Manuscripts for publication, or correspondence regarding the World Reporting Service, should be addressed to Dr. Lee Ling, Plant Production Branch, Agriculture Division, FAO, Viale delle Terme di Caracalla, Rome, Italy; subscriptions and other business correspondence to Documents Sales Service, FAO, Viale delle Terme di Caracalla, Rome, Italy.

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## MULTILINGUAL VOCABULARY OF SOIL SCIENCE

This publication is the result of the work of twenty-nine soil scientists in nine countries. It contains brief definitions of soil terms in eight languages, viz., English, French, German, Spanish, Portuguese, Italian, Dutch and Swedish, and is designed to facilitate international exchange of soil information.

1954, vii + 439 pp. Price: \$ 4.00 - £ 1.0.0.

# FAO Plant Protection Bulletin

VOL. IV, No. 3

A Publication of the

DECEMBER 1955

World Reporting Service on Plant Diseases and Pests

## Highlights of Insect Occurrences in Canada, 1955

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IN general, insect damage in Canada in 1955 was moderate. The most alarming outbreaks of the season were of aphids on grain; these caused extensive damage, mainly to late barley, in all of the major grain-growing areas of the country. The following are the highlights.

A widespread and severe outbreak of aphids occurred on grain in all provinces from Alberta to Prince Edward Island. The corn leaf aphid, *Rhopalosiphum maidis* (Fitch), was the principal species, especially in the Prairie Provinces. The English grain aphid, *Macrosiphum granarium* (Kby.), was of secondary importance and the greenbug, *Toxoptera graminum* (Rond.), a minor pest. A fourth species, *Rhopalosiphum pseudoavenae* (Patch), was numerous in New Brunswick. Major losses occurred in late barley, many stands being abandoned. In the Prairie Provinces well over two million acres were seriously affected, the situation being aggravated by the fact that much of the land ordinarily seeded to wheat was seeded to barley.

Of several cutworm species that are important annually, the army cutworm, *Chorizagrotis auxiliaris* (Grote), was outstanding. During May and June it caused extensive damage in Alberta for the first time in 12 years and in Saskatchewan for the first time on record. In southern Alberta, several thousand acres of mustard and flax were destroyed and alfalfa, barley, and garden crops were severely damaged. In southern Saskatchewan, some 20,000 acres of wheat and barley were damaged, 10,000

acres of wheat being destroyed. No previous occurrence in the Province had caused damage of such magnitude. The bertha armyworm, *Mamestra configurata* Wlk., occurred on rape and flax in north-central and north-eastern agricultural areas of Saskatchewan in the heaviest infestation since 1948. On the other hand, the pale western cutworm, *Agrotis orthogonia* Morr., occurred in the lightest infestation in many years. In south-western Ontario, infestation of vegetable crops by cutworms of various species was about as severe as any on record. Tobacco and sugar beets also were extensively damaged. The armyworm, *Pseudaletia unipuncta* (Haw.), which occurred in outbreak numbers in Eastern Canada in 1954, appeared only in scattered, local infestations; general outbreaks have not occurred in two successive years in Canada.

In several districts of the Red River Valley, Manitoba, wheat was infested by the wheat midge, *Sitodiplosis mosellana* (Gehin). This insect, seldom reported in appreciable numbers in Canada, was recorded in Manitoba for the first time in 1954. A survey of adult grasshoppers in this Province revealed a serious, general build-up, especially in the central portion of the agricultural area.

Some vegetable insects were also prominent. Over 4,000 acres of sugar beets in southern Alberta were sprayed to control flea beetles, probably *Psylliodes punctulata* Melsh., and a carrion beetle, *Silpha bituberosa* Lec.; control measures are rarely necessary on such a scale for these insects. North

of Taber and Cranford, Alberta, infestation of sugar beets by the beet webworm, *Loxostege sticticalis* (L.), was the most severe since 1941. In British Columbia the brown wheat mite, *Petrobia latens* (Müll.), a new pest on onions, caused considerable damage in the Kelowna area. In southern Ontario, the cabbage looper, *Trichoplusia ni brassicae* (Riley), appeared generally in the most severe outbreak in at least nine years: in south-western districts, infestation of the pea weevil, *Bruchus pisorum* (L.), on canning peas was the most severe on record; and in Kent County, Ontario, infestations of the potato aphid, *Macrosiphum solanifolii* (Ashm.), on tomatoes were the most widespread in the memory of growers.

Among the fruit insects, an outbreak of the two-spotted spider mite, *Tetranychus bimaculatus* Harvey, occurred for the first time in south-western Quebec in several commercial apple orchards; and for the first time in Norfolk County, Ontario, the clover mite, *Bryobia praetiosa* Koch, caused severe, local damage to the foliage of apple. Another first occurrence involved the Niagara, Ontario, area, where the white peach scale, *Pseudaulacaspis pentagona* (Targ.), was collected on weeping mulberry near Beamsville. In British Columbia, the orange tortrix, *Argyrotaenia citrana* (Fern.), first observed feeding on holly berries in the fall of 1954, survived the winter and caused concern among holly growers.

Notable among the insects that attack livestock and man, the Rocky Mountain wood tick, *Dermacentor andersoni* Stiles, apparently increasing in central British Columbia, heavily infested 400 cattle on one ranch; 30 were paralyzed and two died. An infestation, apparently of the tropical rat mite, *Bdellonyssus (Liponyssus) bacoti* (Hirst), in a 17-family tenement at Trenton, Ontario, indicates the first establishment of the species in Canada. Eight specimens of the tick *Ixodes cookei* Pack. were removed from a man at Marysville, Ontario, who had visited a doctor seeking a remedy for a sick stomach.

In the household, the brown-banded roach, *Supella supellectilium* (Serv.), occurred in an apartment in Saskatoon, Saskatchewan, and in a dwelling in Ottawa, Ontario. Both are first records for these provinces. In July, the stink beetle, *Nomius pygmaeus* (Dej.), invaded residences in Matachewan, Ontario, in such numbers that the occupants were unable to sleep because of the odor; the insect has been described as the most intensely malodorous creature for its size in the world. Adult flights are frequently associated with forest fires, which may have accounted for the unusual occurrence. Apparently they are driven out of forest areas, their natural habitat, by the smoke. In Ontario and Quebec, reports of the invasion of dwellings by immense numbers of the strawberry root weevil, *Brachyrhinus ovatus* (L.), were unusually numerous.

# Cacao Diseases in Mexico, Nicaragua, Costa Rica and Jamaica

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RECENT developments in Central America and the West Indies indicate that there is a definite trend towards increasing cacao production through new plantings with improved varieties and the application of disease and pest control measures. The following report on the disease situation in Mexico, Nicaragua, Jamaica and Costa Rica is the result of visits made to the first three countries in 1953-54, and covers the period from 1952 to date for Costa Rica.

## *Phytophthora Pod Rot*

In Mexico, disease surveys were made in several plantations in the Tabasco-Chiapas region, where *Phytophthora* pod rot was found to be prevalent and to cause important losses from October through December, the rainiest period. This disease is also widespread in the cacao areas in Nicaragua and Costa Rica. Estimated losses due to this fungus disease in the Atlantic region of Costa Rica were about 47 percent. No estimates have been made for Nicaragua. In Jamaica, pod rot occurs mainly in the wet period of the year, and the amount of losses has not been evaluated.

As in northern South America, the Criollo type cacao appears to be more susceptible to trunk canker than the Trinitario types, although all are susceptible to pod rot. From studies conducted at the Inter-American Cacao Center in Costa Rica it was found that the strain of *Phytophthora* which attacks cacao belongs to a different variety than that which attacks rubber. Consequently, the name *P. palmivora* var. *theobromae* for the cacao strain and *P. palmivora* var. *heveae* for the strain attacking rubber were proposed.

## *Anthracnose*

Anthracnose occurs commonly in all cacao plantations of the four countries visited. Severe attack by *Colletotrichum gloeosporioides* results in leaf fall and subsequent die-back of the branches. It produces also a minor amount of pod rot. Leaf anthracnose is severe in seedlings in nurseries unprotected from intense solar radiation. Protection of these nurseries with overhead shade has shown that anthracnose can be greatly reduced by this practice. Shade is also beneficial in reducing die-back on adult trees and field transplants.

## *Thread Blight*

In the countries visited thread blight is one of the most widespread diseases of the crop and is particularly severe on adult leaves during prolonged periods of heavy rain under dense shade. It develops mainly on the under surface of the limbs. Young flushes have not been observed to be attacked by the fungus. Severe outbreaks occur at the beginning of the rainy period and diminish at its end. Losses of yield are difficult to estimate but in some places may well be of sufficient commercial importance to warrant the application of control measures. It is caused by *Pellicularia koleroga* which also attacks coffee, but a comparative study of the two strains has not been made.

## *Horse Hair Disease*

Horse hair disease is a type of thread blight, but it does not spread over the leaves as does *Pellicularia*. It is reportedly caused

by *Marasmius trichorizus*. This disease has been observed so far only in Costa Rica and is common in most cacao plantations. However, its small economic importance has not induced any detailed study of its developmental cycle or of its control.

### **Rosellinia Root Rot**

Although *Rosellinia* root rot affects principally old trees in poorly drained soils in most cacao-producing countries, it was found in Costa Rica that in a few cases young transplants were also attacked. It is caused by *Rosellinia* spp., but the identity of the species involved is not known. In areas suitable for cacao cultivation this disease is of little importance.

### **Pink Disease**

Pink disease, caused by *Corticium salmonicolor*, occurs in most cacao-growing areas and kills the branches affected, but rarely the whole tree.

### **Fusarium Pod Rot**

*Fusarium* pod rot causes a red rotting in the interior of the pods, particularly when they are over-ripe or when the pod has a wound which permits invasion by the fungus. It has been observed only in a few instances in Costa Rica.

### **Nectria Disease**

An unidentified species of *Nectria* was found to cause small blisters on the trunk and branches of cacao trees but was of negligible importance in the areas visited.

### **Diplodia Pod Rot**

*Diplodia theobromae* is a wound parasite which causes a black rot in the interior of over-ripe pods. It occurs also as a secondary invader in pods rotted by other organisms. It was observed only occasionally.

### **Gray Mold**

Gray mold has been observed only in Costa Rica as causing irregular small patches of dead tissue on the under surface of leaves. The lesions are generally covered by black

to gray mycelial growth. It is tentatively identified as a species of *Diplodia*, a weak parasite of small importance in cacao cultivation.

### **"Morte Subita"**

Trees of healthy appearance have been found to die suddenly prior to a short period of leaf wilting and defoliation. The branches and the trunk exhibit discoloration and exudation of a reddish mucilage. It was observed only in Costa Rica. In many cases it resembles the symptoms caused by *Ceratosomella* spp., which occurs in Ecuador and Venezuela. Occasionally underground insect attack may also cause the death of the trees.

### **Marasmius Disease**

The roots of cacao cuttings transplanted to baskets made of abaca sheath often become infected with species of *Marasmius*, probably *M. semiaustus*, which attacks abaca in the fields in Costa Rica. To avoid this trouble the baskets should be disinfected or altogether discarded for this purpose.

Sporophores of another species of *Marasmius* were found on terminal branches of cacao trees in Costa Rica in a few cases. The pathogenicity of this fungus has not been determined.

### **Cherelle Wilt**

This disease is a wilting and subsequent blackening of the immature cacao fruit and occurs in all cacao-producing countries. In Costa Rica it was reported in one publication to be due to physiological causes of the order of food strain, and in another due to *Phytophthora* attack. Insect injury to the pedicel in the flower stage or on fruits starting to develop may also result in wilting. Losses due to this condition are very heavy at certain times of the year. Efficient methods to combat it are not yet known.

### **"Buba" or Cushion Gall**

Buba or cushion gall is characterized by a hypertrophy of the flower cushion which develops mainly along branches and on

trunks of old cacao trees. In Rivas, Nicaragua, this disease appears to have reduced the productivity of the trees very greatly. In Costa Rica it is of only occasional occurrence. It was not seen in Mexico or Jamaica. Its cause remains undetermined.

### **Root Rot of Nursery Seedlings**

Cacao seedlings grown in nurseries composed of soil often wilt as a result of the attack of several soil inhabiting fungi, namely *Rhizoctonia*, *Fusarium*, *Pythium* and others. Nearly perfect seedling stands are obtained in Costa Rica when the seeds are planted in a layer of sawdust placed upon the seed-bed, and when the developing plants are protected from intense isolation by overhead shade.

### ***Mycena* or False Witches' Broom**

A brooming effect on old cacao trees was observed in Jamaica. A similar condition occurs also on cola (*Cola nitida*) trees in the same general locality where cacao was found affected. The fungus apparently responsible for this condition has been identified as belonging to the genus *Mycena*. This disease is at present considered to be of no great importance. It has not been observed in Mexico, Nicaragua or Costa Rica.

### **"Black Malady" of Rooted Cuttings**

A blackening of the stem was observed in Jamaica in cacao cuttings rooted or being

rooted in propagators where the atmosphere was kept at maximum water saturation. It is reportedly due to the low nutritional status of the cutting material and causes a high incidence of dead cuttings.

### **Red Rust**

Red rust is tentatively described as caused by the alga *Cephaleuros (virescens) mycoidea*, which attacks other crops also. The symptoms of the disease include reddish-brown patches on the branches, defoliation and die-back. It was observed in the Quepos area on the Pacific side of Costa Rica, where there is a long dry period of about 5 to 6 months. The outbreak observed in 1955 appears to have been aggravated by the suppression of shade and an infestation by thrips in the area affected. The disease is considered to be of minor importance in well-kept plantations with proper drainage, shade and fertilization, and it has not been reported from other Latin-American countries.

### ***Thielaviopsis* Pod Rot**

In Costa Rica a pod rot of cacao has been observed with symptoms very similar to those reported from Ecuador, caused by *Thielaviopsis*. The disease appears to occur in fully developed pods previously attacked by *Phytophthora*. *Thielaviopsis* by itself is regarded as of little concern. It was not observed in the other three countries visited.

## Occurrence of *Thyriopsis halepensis* on Pine in Italy

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IN June 1955, the writer was requested to visit a small stand of the Aleppo pine (*Pinus halepensis*) about 40 years old near Campiglia, Livorno province, Tuscany, in central Italy. The pine trees were planted in one row around a large lawn and are surrounded by a thick belt of cypress which acts as a windbreak. The lawn is situated on a plain not far from the sea.

The majority of the Aleppo pine trees showed a very severe defoliation on the lower

branches. Generally only the younger needles still remained on the twigs (Figure 1), while the older ones, when affected and not already fallen, came off at the lightest touch. In addition to the prevalent defoliation, some trees showed die-back on branches. One of those trees had only a few top branches remaining alive. A survey of the roots did not reveal any rot or other abnormal condition.

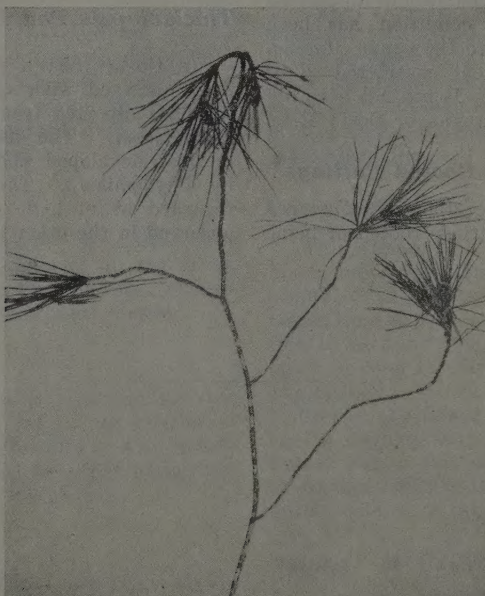


Figure 1. Young needles and branches of Aleppo pine affected by *Thyriopsis halepensis*.

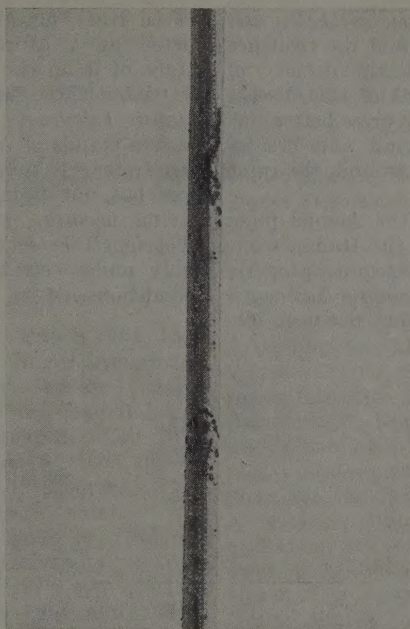


Figure 2. An older needle of Aleppo pine, showing perithecia of *Thyriopsis halepensis*.

An examination of the older needles showed that they bore small, crusty, black irregular dots arranged generally in a circle (Figure 2) and when the needle was green the parts near the dots were conspicuously chlorotic. The black dots proved to be perithecia which open irregularly and contain a small number of short asci with hyaline bicellular ascospores. The perithecia arose from a scantily developed hyaline stroma located under the cuticula of the leaf.

In order to ascertain the identity of the fungus, some specimens were sent to Dr. F. Petrak who determined it as *Thyriopsis halepensis* (Cke.) Theiss. & Syd. As far as the writer is aware, this fungus became known only through the records of a few mycologists and very little is known about it as a pathogen. This fungus was first described by Cooke<sup>1</sup> in 1879 under the name of *Dothidea*

*halepensis* on the basis of specimens on leaves of *Pinus halepensis* collected from France. Later, Theissen and Sydow<sup>2</sup> studied the same specimens and concluded that this fungus does not belong to the genus *Dothidea*. They established a new genus *Thyriopsis* and transferred the fungus into it. A third and most recent record of this fungus was by Petrak<sup>3</sup> who studied specimens sent to him from Suchum, Transcaucasia.

From those publications a thorough description of the fungus became available and its distribution was known to be restricted to France and Transcaucasia. However, no information is available as to the nature of its pathogenicity, and it is not even known whether the two previous findings referred to living or dead needles of Aleppo pine.

<sup>1</sup> COOKE, M.C. 1879-80. Undescribed fungi in the Kew Herbarium. *Grevillea* 8: 34-35.

<sup>2</sup> THEISSEN, F. and H. SYDOW. 1915. Die Dothideales. *Ann. Mycol.* 13: 149-746 (see p. 369).

<sup>3</sup> PETRAK, F. 1925. *Mykologische Notizen*. VIII. *Ann. Mycol.* 24: 1-143 (see pp. 66-68).

In the present case *Thyriopsis halepensis* acted clearly as a parasite and its virulence was definitely enhanced by the density of the stand. The development of this disease was further favored by the cypress belt which protects the pines from wind and creates a very moist atmosphere around the pine trees.

In the neighborhood of the Aleppo pines there was a young stand of the Italian stone pine (*Pinus pinea*) which was quite properly spaced and on which *Thyriopsis halepensis* was also found on some dry needles. On

these trees, however, the fungus apparently acted as a saprophyte and there was no trace of it on the living needles.

After these findings, searches for *Thyriopsis halepensis* have been made in many native stands of Aleppo pine at some distances from the affected planting but the fungus has not been found either on dead or living needles. It appears, therefore, that *Thyriopsis halepensis* can act as a parasite only under certain favorable environmental conditions.

# Plant Disease Situation in the United States<sup>1</sup>

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## ***Persistence and Spread of Curly-top Virus in the Midwest***

IN this Bulletin 2: 86-88, March 1954, the presence of both the North American curly-top virus and its vector, the sugar-beet leafhopper, *Circulifer tenellus* (Baker), in Illinois in 1953 was reported. Recently additional reports have been received showing even more widespread occurrence of this disease in the Midwestern region.

*Sugar beet curly-top disease in Illinois.* H.H. Thornberry, of the University of Illinois, reported sugar beet curly-top disease present again in Illinois in 1954 and 1955. About 2 percent of the sugar beet plants examined in 1954 had typical symptoms of curly top. In 1955 a survey revealed from 2 to 5 percent curly-top-affected plants in sugar beet fields examined. These fields had not been treated with insecticidal dusts or sprays. In tomatoes only an occasional plant showing curly-top symptoms was found. It was not determined whether these fields had been dusted or sprayed with insecticides.

Brittle root of horseradish, strongly suspected but not definitely proven to be caused by the curly-top virus, occurred in the three areas inspected. In the region around East St. Louis, there was from 1 to 3 percent of plants with brittle root symptoms. All fields examined had been dusted or sprayed with DDT. In the Peoria area, two plantings were examined. One which had been sprayed with DDT had about 1 percent brittle-root-affected plants. The other planting, which had not been treated with DDT, had about 3 percent brittle root. In the Chicago area, plants examined in plantings

not treated with DDT had approximately 2 percent brittle root.

*Sugar beet curly top in Minnesota and Iowa.* According to C.L. Schneider reporting co-operative work of the United States Agricultural Research Service and the Minnesota Agricultural Experiment Station, a sugar beet plant with symptoms of the curly-top virus disease was found in experimental plots on the Southern Experiment Station at Waseca, Minnesota, in September 1953 and about the same time, another sugar beet with curly-top symptoms was found near Mason City, Iowa. N. J. Giddings, of the United States Sugar Plant Field Station at Riverside, California, reported that both were infected with curly-top virus.

In the summer of 1954, sugar beets with curly-top symptoms were observed in seven commercial fields in Sibley, McLeod, Renville, and Freeborne Counties in southern Minnesota; occurrence was also reported in Steele and Faribault Counties in southern Minnesota and in Cerro Gordo County in northern Iowa. At each location, relatively few diseased plants were found; in most cases only one or two. Sugar beets with curly top were also found in experimental plots in Ramsey and Waseca Counties in Minnesota.

In 1954, the sugar beets growing in the experimental plots at the Southern Experiment Station, Waseca, Minnesota, were examined for curly top periodically and all plants having symptoms were tagged. Symptoms were observed first on 9 July and continued to appear until the latter part of September. On 12 October, the tagged plants were graded according to the severity of curly top; light (few leaves curled, typical curly-top protuberances present on veins), 13 plants; moderate (most of the inner leaves curled), 14 plants; severe (all leaves curled, plant stunted and foliage yellowish; in some

<sup>1</sup> This report is based upon material submitted by Collaborators of the Plant Disease Epidemics and Identification Section, Agricultural Research Service, United States Department of Agriculture.

cases plant did not develop beyond 6- or 8-leaf stage), 20 plants; dead (plant died, apparently from curly top, after symptoms were observed), 5 plants. In general, the plants most severely affected were those that first showed symptoms early in the season. Out of a total of about 15,000 plants critically examined, 52 showed definite symptoms of curly top.

*Tobacco curly top in Wisconsin.* Robert W. Fulton, of the University of Wisconsin, reported that during July 1954 a disease that had not been observed in previous surveys appeared on tobacco in Wisconsin. Growth of affected plants stopped abruptly. Edges and tips of immature leaves curled under and puckered, while leaves fully expanded at the time of infection yellowed and died after several weeks. Brown streaks were observed in the phloem regions of stems and petioles, but no micro-organisms were seen or cultured from affected tissues.

The disease was seen in many fields in both tobacco-growing areas of the State, but only a few infected plants were found in any one field. Judging from the number of normally developed leaves on infected plants, most of the infection apparently occurred early in July. Only an occasional new infection appeared later in the summer. By late August many infected plants had died.

The disease was readily transmitted in the greenhouse by grafting to *Nicotiana tabacum*, *N. rustica*, *N. glutinosa*, tomato, petunia, and *Datura stramonium*. On two occasions it was transmitted to tomato through dodder (*Cuscuta subinclusa*) but was not transmitted in a number of other trials. Numerous attempts by rubbing extracts of diseased leaves on healthy plants failed to transmit the disease.

In the greenhouse at 75° F. during the winter months only a few infected plants died. Most graft-inoculated plants began to recover 2 to 3 weeks after development of acute symptoms and later made normal growth.

A similar disease was described from Ken-

tucky (FAO Plant Prot. Bull. 2: 134. 1954) as identical in appearance with tobacco leaf curl. The Wisconsin disease differed from descriptions of Asiatic leaf curl in the phloem degeneration, dying of the lower leaves, the absence of leaf enations, and the recovery of infected plants in the greenhouse. These features suggested that the disease might be due to infection by the sugarbeet curly-top virus. Since transmission by the specific vector would provide strong evidence that the Wisconsin disease was curly top, beet leafhoppers were caged in lots of 10 insects for 24 hours on infected leaves and then transferred to a healthy plant on which they were allowed to feed for 4 days or more. Infection of tobacco was obtained in 3 of 5 trials with insects fed on diseased *Datura stramonium*, and in 1 of 2 trials with insects fed on diseased tobacco. No transmission was obtained from diseased tomato. Control lots of 10 insects not previously exposed to infected plants did not transmit the disease. The number of transmissions was small but sufficient to identify the beet leaf hopper as a vector and thus demonstrate that the virus concerned was the sugarbeet curly-top virus.

It has been shown that the curly-top virus can be transmitted to healthy beets by pricking drops of phloem exudate from diseased beets into the crowns of healthy beets. Presumably this method was successful because the virus was introduced directly into the phloem. Tobacco was infected relatively easily with the Wisconsin virus by similar methods. In 3 trials, 8 of 13 tobacco plants were infected by pricking into axillary buds a drop of young diseased leaf extract diluted in phosphate buffer. In other trials 5 of 9 tobacco plants were infected by peeling back a flap of cortex, allowing the infectious extract to run beneath, then binding the flap back in place with grafting rubber.

Since the curly-top virus has a wide host range it may now be established on perennial plants in Wisconsin and other areas of the Midwest. Whether it becomes important on crop plants depends presumably on the behavior of its vector.

## Outbreaks and New Records

### Puerto Rico

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#### *Physalospora perseae* on Mango

A disease of mango (*Mangifera indica*) previously known only from South Africa has been found to cause damage in Puerto Rico that formerly may have been attributed to anthracnose. This fungal pathogen, *Physalospora perseae* Doidge, is responsible for a blossom blight and brown rot of mangos<sup>1</sup> and it agrees in morphological detail with *P. perseae* on avocado<sup>2, 3</sup>.

Symptoms of the disease occasionally first appear in the flowers, where the fleshy disc and ovary are attacked and turn brown and become necrotic. The fungus progresses from the pedicels into the central stalk of the inflorescence. Diseased inflorescences have a blighted appearance with many of the flowers withering and dropping. The affected stalks are brownish or blackish with long, relatively deep, longitudinal fissures. This systemic disease attacks fruits in all stages of development and induces a serious premature drop. The action of this pathogen should not be confused with the drop

of unfertilized fruit, a common phenomenon in mango. Unfertilized fruit characteristically lack developing ovules. Most of the affected young fruit fall without displaying any symptom of the disease other than a slight change to a brownish color. Some fruit adhere to their pedicels until they turn black and mummify. Infected mango trees may drop in excess of 90 percent of their fertilized fruit before these attain a diameter of one centimeter. Drop caused by this fungus continues at a diminishing rate up to fruit maturation. The pathogen often enters the fruit through the vascular regions of the stalk and results in a characteristic brown rot which imparts coriaceous texture to the outer rind and flesh. The seed is attacked through the funiculus, and sections show that a discolored, diseased spot develops internally from the chalazal region to involve eventually the entire structure.

*Physalospora perseae* also attacks the twigs and small limbs of mango, producing extensive cankers which eventually may girdle and kill these parts. The affected bark is dark colored and somewhat sunken at first, but later it cracks and falls away from the dead, discolored wood. Pycnidia and perithecia are found in abundance on the dead portions. Only perithecia have been observed on infected fruits, where the minute size of these pustules readily distinguish them from those of anthracnose.

<sup>1</sup> MARLOTH, R.H. 1947. The mango in South Africa. Agr. Dept. Bull. 282: 1:27.

<sup>2</sup> Official communication from F.C. Loest, dated 20 August 1955.

<sup>3</sup> DOIDGE, E.M. 1922. A fungus of economic importance on the avocado. Bothalia 1: 179-186.

## Plant Quarantine Announcements

### Guatemala

Decree No. 446 of 25 October 1955, published in *El Guatemalteco* No. 68, 26 October 1955, promulgates the Plant Protection Act which establishes the authorities and powers of the Ministry of Agriculture and its Plant Protection Division, and provides a basis for actions required for the combatting of plant diseases and pests and the prevention of their spread. All previous legislative provisions which are not in accord with the Act are thereby repealed.

The Act, which came into force 15 days after publication, is to operate through the Plant Protection Division, which will determine the diseases and pests requiring compulsory reporting, carry out investigations and give advice on control measures. To this end, the Division is authorized to inspect storages, vehicles, and private and public properties. The Ministry of Agriculture is empowered to issue regulations for the implementation of the Act and for the restriction and prohibition of the movement of plant materials.

The owners and users of land are obliged to report the occurrence of pests and diseases, and to undertake control measures as determined by the Plant Protection Division or its agents.

All plants and plant products intended for exportation must be inspected by the Plant Protection Division which will issue phytosanitary certificates to cover the shipments.

Plants, seeds, tubers, nursery stocks and plant products intended for importation must be accompanied by phytosanitary certificates and are subject to inspection and permission by the Plant Protection Division, before they are delivered to importers. Shipments not accompanied by certificates may be permitted to enter the country only when they can be effectively fumigated or disinfected. Importation of infected or infested plants for scientific studies may be permitted if the Plant Protection Division is satisfied that measures have been taken to prevent the spread of diseases or pests. The importation of used sacks and packings liable to carry pests and parasites is prohibited. A list of plants and plant products, the importation or exportation of which is to be restricted or prohibited, will be issued by the Ministry of Agriculture.

The importation and exportation of plants and plant products may be effected only through

the following customs and other points which may be subsequently designated:

Central customs office (Guatemala City)  
La Aurora Airport  
Express Aéreo  
Santo Tomás  
Puerto Barrios  
San José  
Champerico  
Ayutla  
El Carmen  
San Cristobal Frontera  
Angiatú  
Parcel post customs.

The importation of pesticides is also subject to supervision by the Plant Protection Division in order to ensure their contents and quality.

### India

1. Notification No. F. 6-18/53-Dte. 1 of 28 October 1954, published in the *Gazette of India* No. 45, 6 November 1954, amends Notification No. F. 320/35-A of 20 July 1936 with regard to the importation of potatoes.

Under the amended regulations, potatoes, other than those from Burma, may not be imported by sea except through Bombay or Madras, where the potatoes will be inspected and, if necessary, fumigated or disinfected by an authorized officer, and will be certified by him to be free from pests and diseases. In addition to the requirements specified in the 1936 Notification (see FAO Plant Prot. Bull. 1: 77, 1953.), the official certificates to accompany imported potatoes should also state that the potatoes included in the consignment are free from Colorado beetle (*Leptinotarsa decemlineata*), golden nematode (*Heterodera rostochiensis*) and wart disease (*Synchytrium endobioticum*).

2. The following three notifications, issued by the Ministry of Food and Agriculture in 1955, amend the Rules for regulating the import of plants, etc., into India (Notification No. F. 320/35-A of 20 July 1936, as amended).

Notification No. F. 6-5/55-PPS, dated 25 May 1955, declares that Port Blair on the Andaman Islands ceases to be a "prescribed port" for entry of imported plant materials.

Notification No. F.6-1/55-PPS, dated 19 July 1955, provides mainly for drafting changes or changes concerning domestic quarantine measures to Notification No. F. 320/35-A.

Notification No. F. 6-12/55-PPS, dated 3 September 1955, authorizes the importation by air of fruits and vegetables intended for consumption from Afghanistan through Bombay in addition to Amritsar, provided such fruits and vegetables are fumigated at the Sewri Quarantine Station at Bombay (see FAO Plant Prot. Bull. 2: 190. 1954).

3. The following two notifications, issued by the Ministry of Food and Agriculture in 1955, amend Notification No. 1581 of 1 October 1931 concerning the importation of American or West Indies cotton into India.

Notification No. F. 6-4/54-Dte. 1, dated 9 August 1955, authorizes the importation of American or West Indies cotton through the port of Cochin, in addition to the ports of Bombay and Madras, the existing authorized ports of entry. When the consignment is destined for Cochin, the consignee should furnish the required information concerning the shipment, not less than 10-14 days before arrival, to the Traffic Manager and the Quarantine Inspector (Fumigation), Cochin Port, and the consignment must be disinfected in a manner prescribed by the Government of Travancore-Cochin (see FAO Plant Prot. Bull. 1: 110-111. 1953).

Notification No. F. 6-4/55-PPS, dated 3 October 1955, is mainly a recasting of the wording of the existing rules. American or West Indian cotton may not be imported into India by sea except through the ports of Bombay, Madras or Cochin and unless the prescribed conditions are complied with. It may not be imported by air except through the airports of Bombay or Madras and unless it is of sample consignments of ginned cotton not exceeding 20 lb. each which have been fumigated before export and packed in a closed container and are accompanied by a certificate of fumigation. Such consignments will be examined and, if necessary, fumigated again on arrival, except where the consignments are intended for other countries.

### Mauritius

The Genus *Rosa* (Conditions of Importation) Proclamation of 13 July 1955 prescribes that the importation into Mauritius of plants or parts thereof of all species of the genus *Rosa* from Australia, New Zealand and Italy shall be permitted only if accompanied by a certificate signed by an official authority of the country of origin. The certificate should state that the plants or parts thereof originate from areas where the virus disease known as rose wilt does not exist.

## News and Notes

### Plant Protection Agreement for South East Asia and the Pacific

The South East Asia and Pacific region, in spite of its vast area under cultivation and long history in crop production, is still free from some of the most serious plant diseases and pests which have been causing tremendous losses in other parts of the world. Such diseases and pests, if introduced into South East Asia and the Pacific, would threaten the production of several major crops in the region as a whole. For instance, the South American leaf blight (*Dothidella ulei*), which has handicapped the progress of the rubber industry in the American tropics, may have even more disastrous effects if it becomes established in the rubber-growing countries in Asia. The danger of the spread of diseases and pests is constantly growing because of the increased speed and range of modern air traffic. With this in mind, the Commissioner-General for the United Kingdom in South East Asia convened a phytosanitary conference in 1949 to consider means of co-operation between governments for the prevention of the introduction of such diseases and pests. To this end, the conference recommended the establishment of a regional phytosanitary convention.

In April 1954, the Government of the United Kingdom proposed to the Director-General of FAO that FAO undertake to negotiate, for this purpose, a supplementary agreement under the International Plant Protection Convention. In pursuance of this proposal, a Plant Protection Meeting was convened by FAO in Singapore, 13-17 December 1954, and was attended by representatives of ten governments. The Meeting unanimously adopted a draft Plant Protection Agreement for the South East Asia and Pacific Region, and recommended that it be submitted to the FAO Council for approval and, subsequently, to all governments responsible for territories in that region, with a view to their acceptance.

The Agreement, which is a supplementary agreement to the International Plant Protection Convention, provides for measures regulating the import of plants from other regions as well as movement of plants within the region, and for the establishment of a regional committee as an advisory body to participating governments on matters relevant to the Agreement. Included also are two appendices, one consisting of a tentative list

of destructive diseases and pests which are not yet established in the region and against the introduction of which special caution should be exercised, and another providing specific measures to exclude the South-American leaf blight disease of hevea rubber.

The Twenty-first Session of the FAO Council in June 1955 approved the draft agreement in principle and the redrafted text was approved by the Twenty-third Session of the Council in December 1955. The Agreement has been communicated to governments concerned and will enter into force immediately after three governments have become parties to it. It is now open for signature in Rome until 30 June 1956 or until the date of its entry into force, whichever date is the later.

### Inter-American Technical Cacao Committee

The sixth meeting of the Inter-American Technical Cacao Committee, under the auspices of the Government of the State of Bahia, Brazil, in co-operation with a number of local agricultural institutions, will meet 20-27 May 1956 in Salvador, Bahia, Brazil.

At this meeting, the chairmen of various permanent sub-committees will report on their work and accomplishments since the fourth meeting held in 1954 in Turrialba, Costa Rica. The discussions will cover all aspects of cacao researches, including cacao botany, breeding, cultural methods, pathology, entomology, processing and economics. A large number of technical papers will be presented. An important feature will be a symposium on cacao diseases and pests which will include three main speakers. The cacao quarantine measures recommended by the fifth meeting will probably be discussed further.

Salvador in Bahia is a picturesque city, easily accessible by local and international airlines. Among several excursions planned, the one to the Ilheus-Itabuna-Urucuca cacao area will be most interesting.

Any further enquiries should be made through the correspondence secretary at the Inter-American Cacao Center, Inter-American Institute of Agricultural Sciences, Turrialba, or directly to the Comissao Organizadora, VI Reuniao Interamericana de Cacao, Instituto de Cacao, Caixa Postal 223, Salvador, Bahia, Brazil.

## Pesticide Tolerance Schedule in the United States

By means of amendments and additions to the general regulations for setting tolerances and granting exemptions, specific tolerances for residues of pesticides listed below in or on certain specific fruits, vegetables or other raw agricultural commodities, in p.p.m., have been established in the United States.

|  |       |
|--|-------|
| Aramite  | 1.0   |
| Aramite (on alfalfa and soybean plants)            | 0     |
| Captan   | 20.0  |
| Chlorobenzilate                                    | 5.0   |
| Chlortetracycline (on uncooked poultry)            | 7.0   |
| EPN (on almonds, cottonseed, pecans, walnuts)      | 0.5   |
| Ferbam (on almonds)                                | 0.1   |
| Malathion  | 8.0   |
| Maneb  | 7.0   |
| Maneb (on almonds, potatoes)                       | 0.1   |
| Methoxychlor (on forage legume and forage grasses) | 100.0 |
| Methoxychlor (on fruit and vegetables)             | 14.0  |

|   |       |
|---|-------|
| Methoxychlor (in fat of cattle, sheep and hog meat)             | 3.0   |
| Methoxychlor (on grains)  | 2.0   |
| Methyl bromide (inorganic bromides) (on apples, pears, quinces) | 5.0   |
| Methyl bromide (on eggplants, onions, tomatoes)                 | 20.0  |
| Methyl bromide (on beets, rutabagas, turnips)                   | 30.0  |
| Methyl bromide (on alfalfa hay, beans, peas and grains)         | 50.0  |
| Methyl bromide (on potatoes and sweet potatoes)                 | 75.0  |
| Methyl bromide (on cottonseed)                                  | 200.0 |
| Phygon (on celery, tomatoes)                                    | 3.0   |
| Sulphenone  | 8.0   |
| Systox  | 0.75  |
| 3-(3,4) - dichlorophenyl 1,1 - dimethylurea (Karmex W)          | 1.0   |
| Zineb (on mushrooms)  | 7.0   |
| Ziram (on strawberries)   | 7.0   |
| Ziram (on almonds, pecans)                                      | 0.1   |

Allethrin has been exempted from the requirement of a tolerance for residues when used before harvest in the production of a number of vegetables, but not when used at time of or after harvest.



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